

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-60 (canceled)

81 (currently amended). A method for screening members of a combinatorial library, the method comprising

simultaneously flowing a test fluid through six or more vessels, each of the six or more vessels comprising a member of the combinatorial library,

~~controlling the flowrate of the test fluid to be about the same in the six or more vessels by~~ simultaneously flowing the test fluid through six or more flow restrictors, each of the six or more flow restrictors providing fluid communication between one of the six or more vessels and (i) an entrance control volume, or alternatively, (ii) an exit control volume, the resistance to fluid flow being greatest and approximately the same in each of the six or more flow restrictors so that the flowrate of the test fluid through each of the six or more vessels is approximately the same,

simultaneously contacting at least six of the six or more library members with the test fluid in the six or more vessels,

simultaneously detecting changes in the test fluid following contact with each of the six or more library members, and

correlating the changes in the test fluid to a property of each of the six or more library members.

92 (currently amended). A method for screening catalysts for a reaction of interest, the method comprising

simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising a different candidate catalyst,

~~controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by~~

simultaneously flowing the one or more reactants through six or more flow restrictors, each of the six or more flow restrictors providing fluid communication between one of the six or more reaction vessels and (i) an entrance control volume, or alternatively, (ii) an exit control volume, the resistance to fluid flow being greatest and approximately the same in each of the six or more flow restrictors so that the flowrate of the one or more reactants through each of the six or more reaction vessels is approximately the same,

simultaneously contacting the candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and

simultaneously detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

Claim 63 (canceled)

¹⁰~~64~~ (previously presented). The method of claims ⁸~~61~~ or ⁹~~62~~ wherein each of the six or more flow restrictors provide fluid communication between one of the six or more reaction vessels and an entrance control volume.

¹~~65~~ (previously presented). A method for screening catalysts for a reaction of interest, the method comprising

feeding one or more reactants through one or more distribution valves to six or more reaction vessels, the one or more reactants being fed simultaneously to at least two of the reaction vessels, each of the six or more vessels comprising an inlet in fluid communication with an entrance control volume, an outlet in fluid communication with an exit control volume, and a different candidate catalyst in the reaction vessel, the one or more distribution valves providing selective fluid communication between the entrance control volume and the six or more reaction vessels,

contacting the six or more different candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, at least two different candidate catalysts being contacted simultaneously with the one or more reactants in the at least two reaction vessels into which the one or more reactants are fed simultaneously,

discharging reaction products and unreacted reactants, if any, from the six or more reaction vessels, through one or more selection valves to one or more detectors, the one or more selection valves providing selective fluid communication between the six or more reaction vessels and the one or more detectors, reaction products or unreacted reactants being discharged simultaneously from the at least two reaction vessels into which the one or more reactants are fed simultaneously,

controlling the contact time to be about the same for each of the six or more candidate catalysts by synchronized operation of one or more distribution valves and the one or more selection valves, and

detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates, the resulting reaction products or unreacted reactants discharged simultaneously from the at least two vessels being detected simultaneously.

¹²₆₅ (previously presented). The method of claim ¹¹~~65~~ further comprising controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels.

³₆₅ (previously presented). The method of claim ¹¹~~65~~ further comprising controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by flowing the one or more reactants through six or more flow restrictors, each of six or more flow restrictors providing fluid communication between one of the six or more vessels and (i) the

one or more distribution valves, or alternatively, (ii) the one or more selection valves.

~~48~~ (previously presented). The method of claim ~~47~~ wherein the resistance to fluid flow within a given flow channel is greatest in the flow restrictor, and the resistance to flow in each of the six or more flow restrictors is approximately the same, such that maintaining a higher pressure in the entrance control volume than in the exit control volume results in fluid flow through the at least six vessels that is apportioned approximately equally between each of the at least six vessels.

~~55~~ (previously presented). The method of claim ~~54~~ wherein each of the six or more flow restrictors provide fluid communication between one of the six or more reaction vessels and the one or more distribution valves.

~~60~~ (currently amended). The method of claim ~~58~~ further comprising controlling the flowrate of the one or more reactants ~~with~~ to be about the same in the six or more reaction vessels by flowing the one or more reactants through one or more flow regulators.

Claim 71 (canceled).

~~72~~ (currently amended). A method for screening catalysts for a reaction of interest, the method comprising

simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising an inlet in fluid communication with an entrance control volume, an outlet in fluid communication with an exit control volume, and a different candidate catalyst in the reaction vessel,

~~controlling the flowrate of the one or more reactants to be about the same in the six or more vessels by~~ simultaneously flowing the one or more reactants through ~~the~~ six or more flow restrictors, each of the six or more flow restrictors providing

fluid communication between one of the six or more vessels and the entrance control volume, the resistance to fluid flow being greatest and approximately the same in each of the six or more flow restrictors so that the flowrate of the one or more reactants through each of the six or more reaction vessels is approximately the same,

contacting the six or more different candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and

detecting the reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

Claims 73-81 (withdrawn).

82 (currently amended). The method of claim 61 wherein the time from initial contact of a library member with the test fluid to detection of changes in the test fluid is approximately the same for each of the plurality of confined six or more library members.

83 (previously presented). The method of claim 61 wherein the detecting step determines changes in the composition of the test fluid.

84 (previously presented). The method of claim 61 wherein the detecting step determines changes in the composition of the test fluid using gas chromatography, mass spectrometry, visible spectrometry, ultraviolet spectrometry, ultraviolet spectrometry or infrared spectrometry.

85 (previously presented). The method of claim 61 wherein the six or more library members are at least forty-eight library members.

¹⁵~~15~~ ¹⁶~~16~~ (previously presented). The method of claim ~~61~~ wherein the total time to screen the six or more library members is less than about six minutes.

¹⁶~~16~~ (previously presented). The method of claim ~~61~~ wherein the total time to screen the six or more library members is less than about three minutes.

¹⁷~~17~~ (previously presented). The method of claim ~~61~~ wherein the six or more library members are at least forty-eight library members and the total time to screen the at least forty-eight library members is less than about forty-eight minutes.

¹⁸~~18~~ (currently amended). The method of claim ~~61~~ wherein the six or more library members are at least forty-eight library members and the total time to screen the at least forty-eight library members is less than about twenty-four minutes.

¹⁹~~19~~ (previously presented). The method of claim ~~61~~ wherein the six or more library members are exposed to a uniform temperature or a temperature gradient during the test.

²⁰~~20~~ (currently amended). The method of claim ~~61~~ wherein about the same amount of each of the plurality of six or more library members are present in the respective vessels.

²¹~~21~~ (previously presented). The method of claim ~~61~~ wherein the test fluid is a gaseous test fluid.

²²~~22~~ (previously presented). The method of claim ~~61~~ wherein the test fluid is a liquid test fluid.

²³~~23~~ (previously presented). The method of claim ~~61~~ wherein the library member is a solid.

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95 (previously presented). The method of claim 82 wherein the library member is a liquid.

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96 (currently amended). The method of claim 81 wherein the test fluid is a gaseous test fluid ~~during the reaction of interest~~ and the library member is a solid.

26
97 (previously presented). The method of claim 81 wherein the test fluid is a gaseous test fluid and the library member is a liquid.

27
98 (currently amended). A method for screening catalysts for a reaction of interest, the method comprising
simultaneously feeding one or more reactants through six or more reaction vessels, each of the six or more vessels comprising a different candidate catalyst,

~~controlling the flowrate of the one or more reactants to be about the same in the six or more reaction vessels by~~
simultaneously flowing the one or more reactants through six or more flow restrictors, the flow restrictors being capillary tubes or micromachined channels, each of the six or more flow restrictors providing fluid communication between one of the six or more reaction vessels and (i) an entrance control volume, or alternatively, (ii) an exit control volume, the resistance to fluid flow being greatest and approximately the same in each of the six or more flow restrictors so that the flowrate of the one or more reactants through each of the six or more reaction vessels is approximately the same,

contacting the candidate catalysts with the one or more reactants in the six or more reaction vessels under reaction conditions for the reaction of interest, and

detecting resulting reaction products or unreacted reactants to determine the efficacy of the six or more catalyst candidates.

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99 (previously presented). The method of claims 72 or 98 further comprising

discharging reaction products and unreacted reactants, if any, from the six or more reaction vessels, and

sampling the discharged reaction products or unreacted reactants with a sampling probe, the sampling probe being in fluid communication with one or more detectors.

¹²⁹
~~100~~ (currently amended). The method of claims ~~62, 72 or 98~~ wherein the time from initial contact of a catalyst with the one or more reactants to detection of the reaction products or unreacted reactants is approximately the same for each of the plurality of six or more catalysts.

²²⁷
~~101~~ (previously presented). The method of claims ~~62, 72 or 98~~ wherein the detecting step determines the reaction products or unreacted reactants using gas chromatography, mass spectrometry, visible spectrometry, ultraviolet spectrometry, ultraviolet spectrometry or infrared spectrometry.

²³¹
~~102~~ (currently amended). The method of ~~any of~~ claims ~~62, 72 or 98~~ wherein the six or more catalysts are exposed to a uniform temperature or a temperature gradient.

²³³
~~103~~ (currently amended). The method of ~~any one of~~ claims ~~62, 72 or 98~~ wherein the six or more catalysts are confined in the reaction vessels in the form of fixed beds.

²³⁴
~~104~~ (currently amended). The method of ~~any one of~~ claims ~~72 or 98~~ wherein the fluid handling system comprises

a selection valve providing selective fluid communication between a selected vessel and the detector, such that the reaction products or unreacted reactants can be sequentially directed from the selected vessel to the detector, and

a fluid distribution valve providing selective fluid communication between the entrance control volume and the inlet of a selected vessel, such that the one or more reactants can be directed into the selected vessel,

the method further comprising synchronizing the fluid distribution valve and the selection valve such that a time interval between the initial contact of the ~~test fluid~~ one or more reactants with ~~a library member~~ one of the six or more catalysts and detection of ~~the test fluid reaction products or unreacted reactants~~ is ~~about~~ approximately the same for each of the ~~plurality of library members~~ six or more catalysts.

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